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Audio signal separation using BSS techniques

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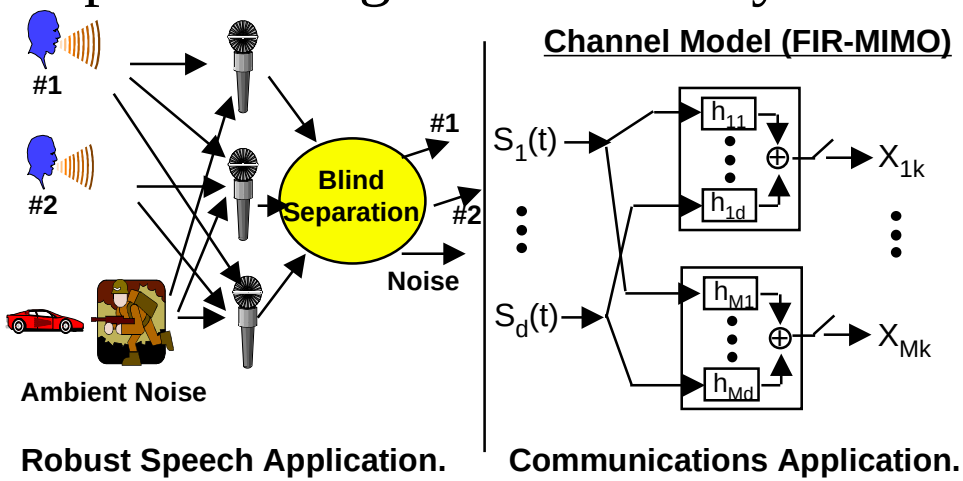
Motivation

- Interfering signals
  - affect communication
  - reduce speech recognition accuracy

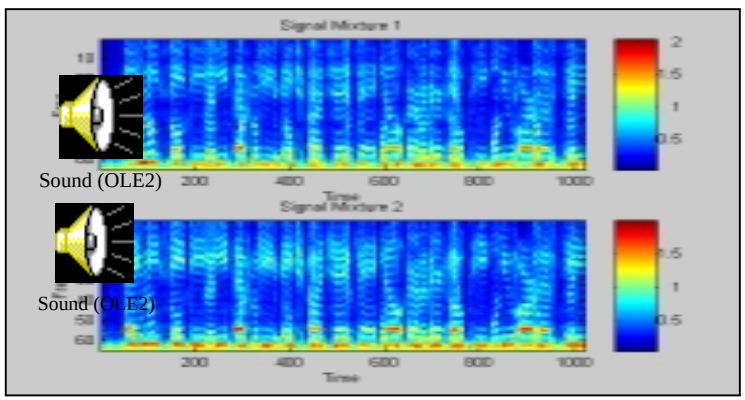


- Goal: robust speech recognition or interference free communication

Blind Signal separation state of the art

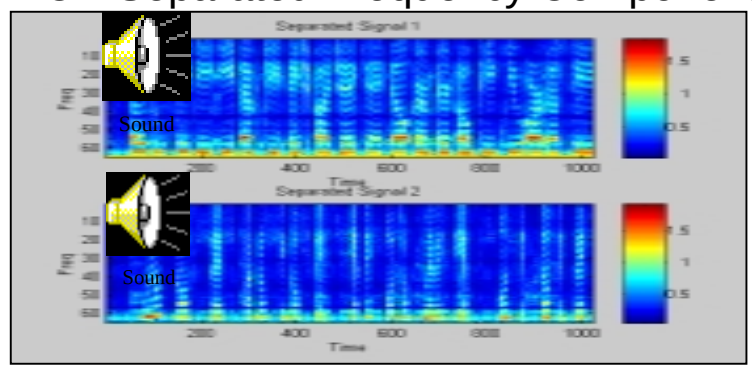
- Techniques developed so far are based on:
  - Constant modulus algorithm (CMA), Independent component analysis (ICA), polyspectra and time-frequency
- Example of ICA (Frequency domain - JADE ICA):

Spectrograms of Speech Signal Mixtures



JADE-ICA on Each Frequency Bin With Port Deswapping and Normalization

ICA-Separated Frequency Components



Inverse Spectrogram Transform

Separated Speech Signals

- Used 16-tap random channel and cross-channel filters and mixing matrix [0.4 0.6; 0.6 0.4]
- Fs=8 khz, spectrogram window size=128